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CETIOSAURUS

As long as two double-decker buses, *Cetiosaurus* was the first sauropod ever to be discovered.

The plant-eating sauropods of the Jurassic Period were the biggest of all dinosaurs. *Cetiosaurus* needed huge amounts of food to stay alive.

ENORMOUS APPETITE

An African elephant eats the equivalent of one third of its body weight each day. Enormous *Cetiosaurus* was more than four times the size of an elephant but its small head and weak teeth were not capable of chewing such a lot of vegetation each day. So how did it survive?

LEAFY SNACKER

Scientists once thought sauropods ate a lot of soft water plants that did not need much chewing. But *Cetiosaurus'* extremely long neck was best suited to browsing on leaves at the top of tall trees.

TOOTHY TOOL

Cetiosaurus used its spoon-shaped teeth to rake off leaves. But the hard work of eating was done in its stomach by gastroliths (stones) that the dinosaur swallowed with its food.

PEBBLE POWER

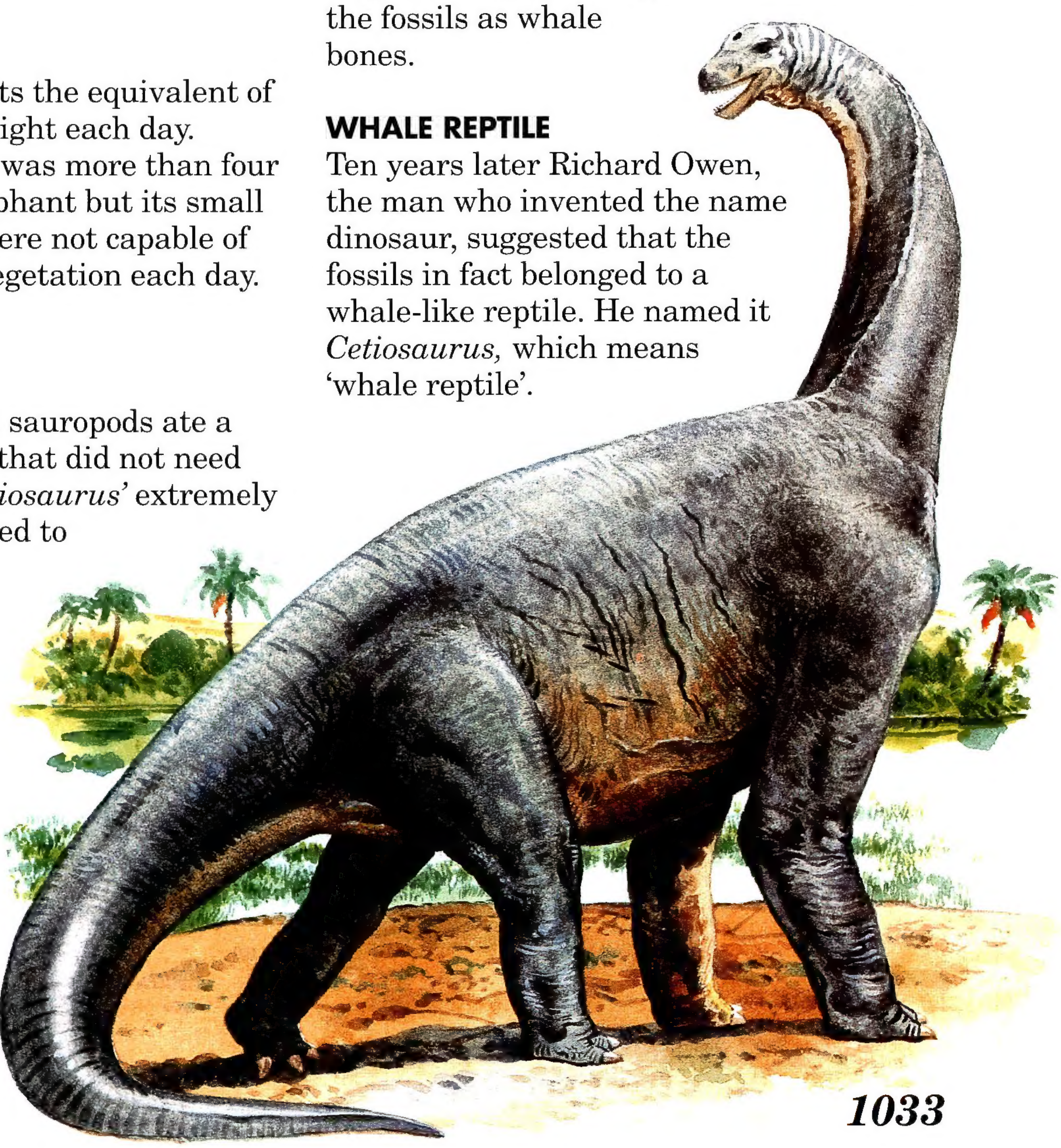
A strong muscular sack, like a bird's gizzard, churned the vegetation around and the pebbles mashed the dinosaur's meal to a mushy paste.

BONE MIX-UP

Cetiosaurus' bones were first discovered over 160 years ago in Oxfordshire, England. Expert Georges Cuvier identified the fossils as whale bones.

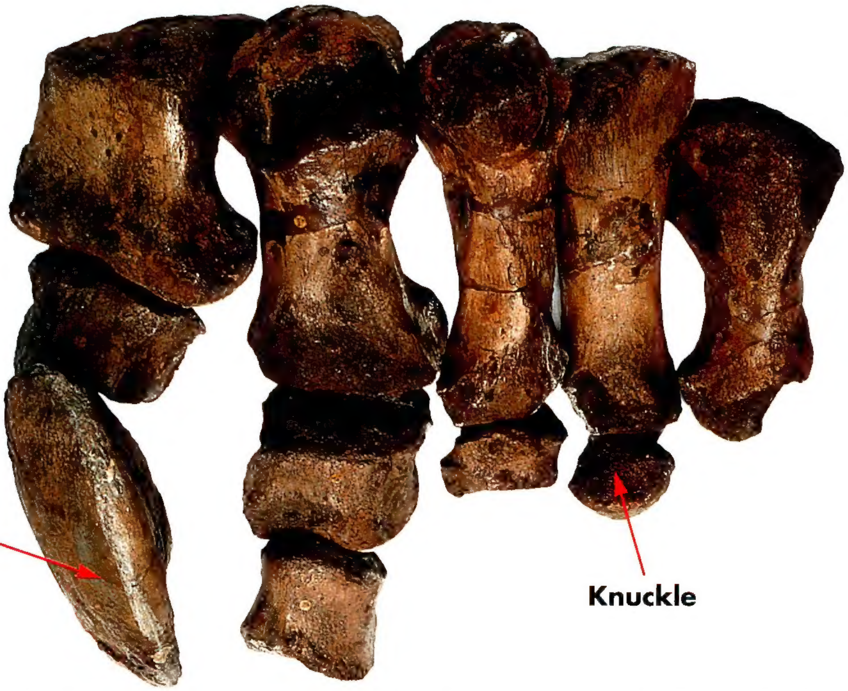
WHALE REPTILE

Ten years later Richard Owen, the man who invented the name dinosaur, suggested that the fossils in fact belonged to a whale-like reptile. He named it *Cetiosaurus,* which means 'whale reptile'.



18 CM: THE LENGTH OF CETIOSAURUS' THUMB CLAW

***Cetiosaurus* was a huge sauropod. Just the large claw of this left front foot would have stretched over half the length of this page.**

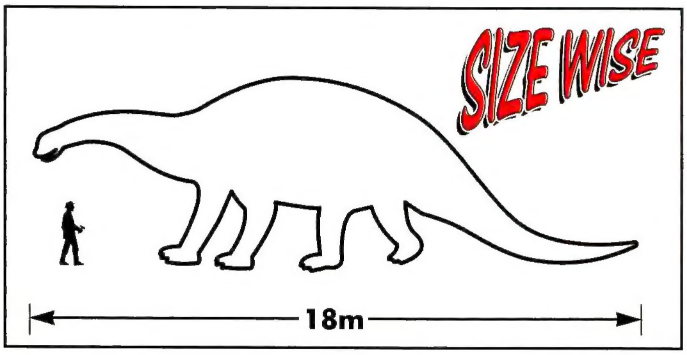


Large claw which may have acted as an anti-slip device

Knuckle

DEFINITELY A DINOSAUR

More bones of *Cetiosaurus* were later found in the same area of Oxfordshire. In 1869 Thomas Huxley finally confirmed that *Cetiosaurus* was a dinosaur that must have spent most of its time on land.



MONSTER FACTS

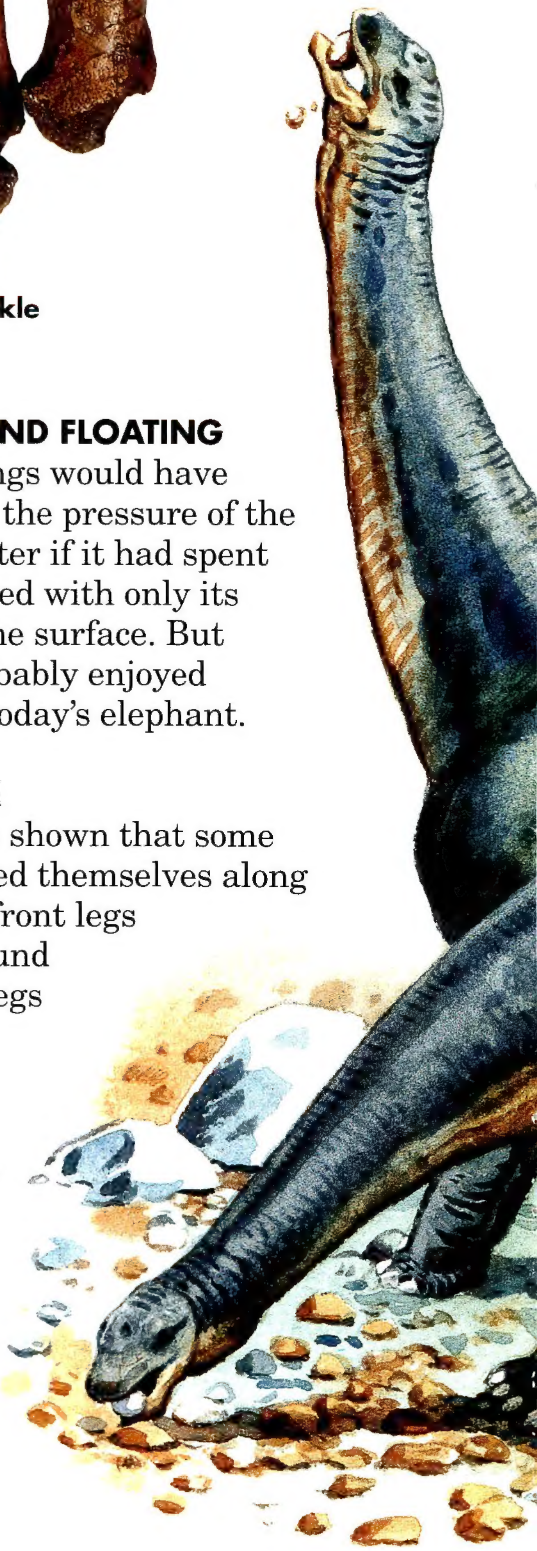
- **NAME:** *Cetiosaurus* (seet-ee-oh-saw-rus) means 'whale reptile'
- **SIZE:** up to 18m long
- **FOOD:** plants
- **LIVED:** about 145 million years ago in the Late Jurassic Period in southern England and Morocco, north Africa

WALLOWING AND FLOATING

A sauropod's lungs would have collapsed under the pressure of the surrounding water if it had spent all day submerged with only its nostrils above the surface. But *Cetiosaurus* probably enjoyed wallowing like today's elephant.

SEMI-SWIMMER

Trackways have shown that some sauropods pushed themselves along in water. Their front legs touched the ground and their hind legs floated behind.



***Cetiosaurus* (right) could never have chewed all the food they ate. So, they sent it straight down to their stomachs, along with stones they swallowed. The stones helped grind the food.**

SOLID BACKBONE

Most sauropods had hollow areas in their backbones to make them lighter. But more primitive *Cetiosaurus* had a solid backbone. Its bulky body was supported by four pillar-like limbs and balanced at either end by its long neck and tail.

TOWERING SAUROPOD

A *Cetiosaurus* thigh bone was found in Morocco, north Africa, in 1979. It is almost as high as a football goalpost and it gives us a good idea of how *Cetiosaurus* towered above the ground.

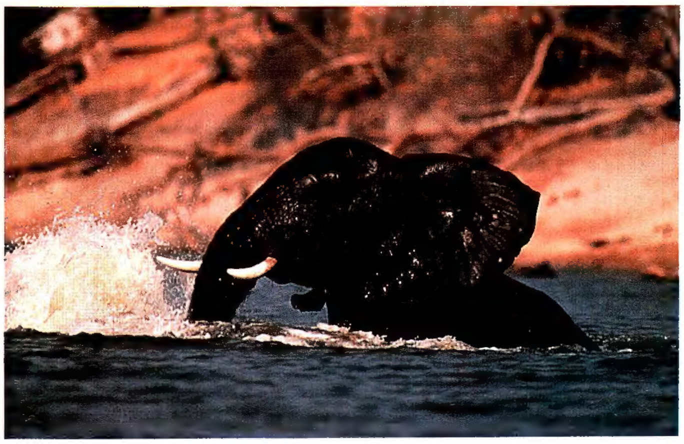
SAFETY IN NUMBERS

The sheer size of adult *Cetiosaurus* meant they were unlikely to be attacked by hungry flesh-eaters. But their young were always at risk. For extra protection, the younger dinosaurs probably travelled at the centre of a herd of adult *Cetiosaurus*.

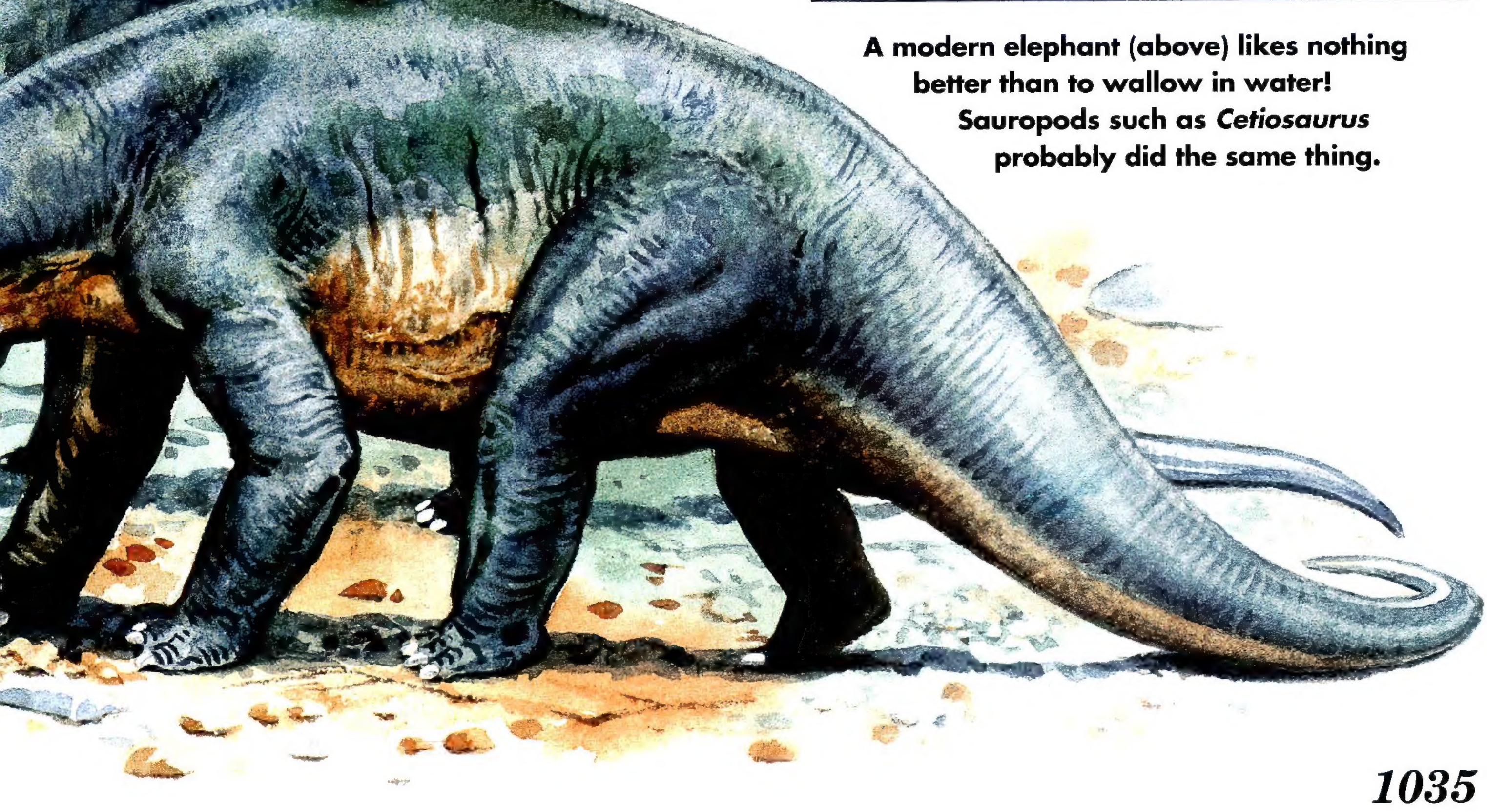
IT'S A FACT

STONY STOMACH

One specimen of the North American sauropod *Barosaurus* was found with 64 polished stomach stones between its ribs. This shows that large dinosaurs needed lots of gastroliths to cope with the great quantities of plant food that they swallowed each day.



A modern elephant (above) likes nothing better than to wallow in water! Sauropods such as *Cetiosaurus* probably did the same thing.



EORAPTOR

Recently discovered *Eoraptor* may be the world's oldest dinosaur.

E*oraptor* was found almost by chance. In 1991 Argentinian student Riccardo Martinez was working on site with a team of scientists in the Valley of the Moon desert in Argentina, South America. Just as he was leaving the site, he noticed an unusual piece of rock glinting in the sun.

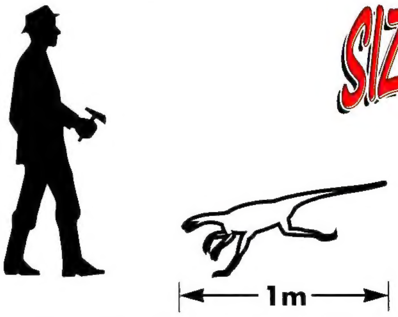
GLITTERING PRIZE

Picking up the piece of rock, Martinez discovered it was two small, fossilized teeth. Eventually, an almost complete skeleton was unearthed. It was declared the 'most primitive dinosaur ever found'.

STRONG GRASP

Eoraptor means 'dawn hunter'. It was born at the dawn of the Age of the Dinosaurs and hunted tiny reptiles. No bigger than a large dog, *Eoraptor* was a lethal predator. It chased its victim on two speedy legs and grabbed it with strong, three-fingered hands.

SIZE WISE

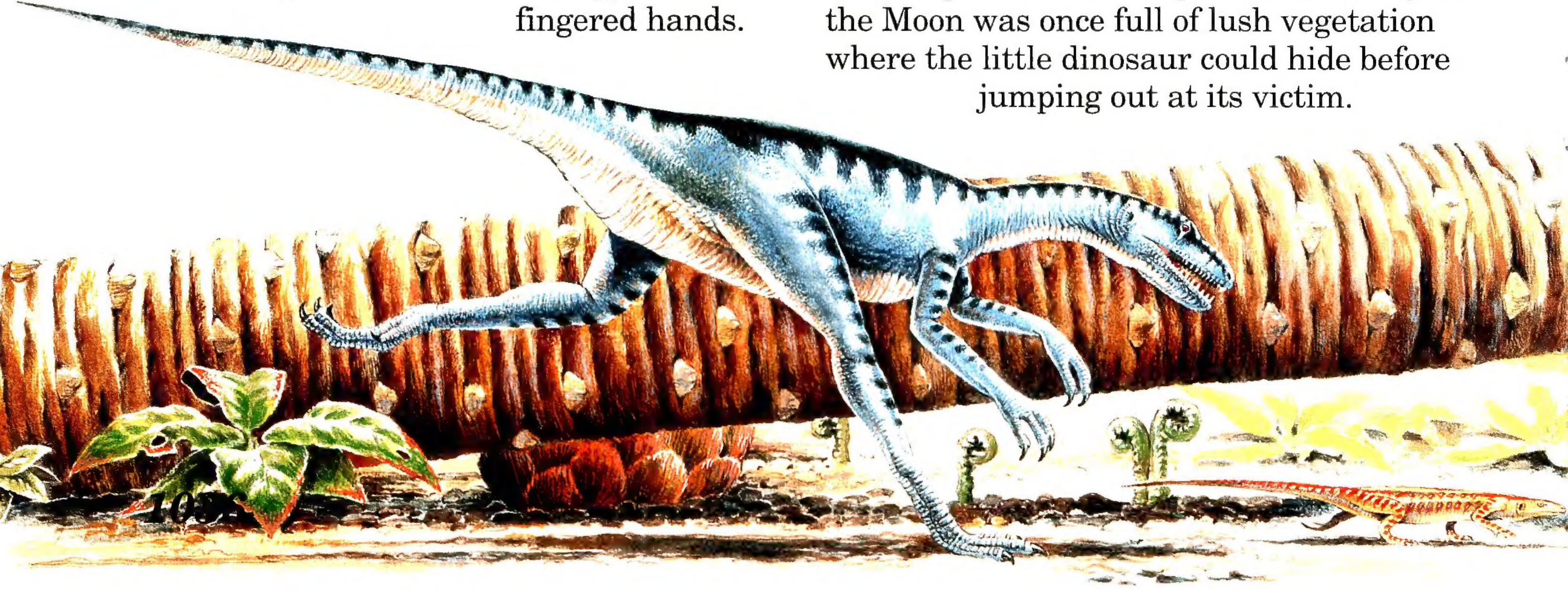


MONSTER FACTS

- **NAME:** *Eoraptor* (ee-oh-rap-tor) means 'dawn hunter'
- **SIZE:** 1m long
- **FOOD:** small animals or the young of larger dinosaurs
- **LIVED:** about 225 million years ago in the Late Triassic Period in the Valley of the Moon, Argentina, South America

SURPRISE ATTACK

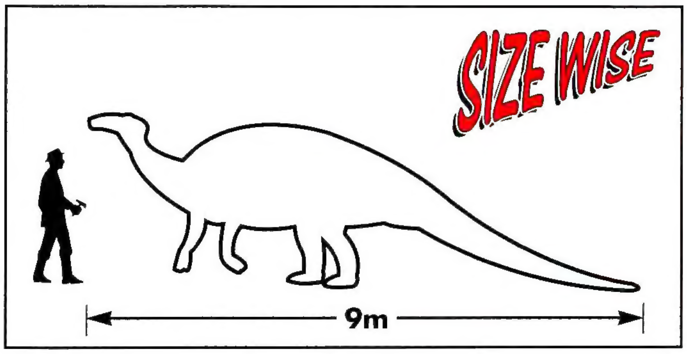
Eoraptor had a mixture of teeth. Some were as sharp as steak knives, others were leaf-shaped like a sauropod's. The Valley of the Moon was once full of lush vegetation where the little dinosaur could hide before jumping out at its victim.



KRITOSAURUS

Gentle *Kritosaurus* was in constant danger from predators as it browsed among ferns and leafy plants.

Predators like *Albertosaurus* were on the constant lookout for *Kritosaurus*. Some experts think that the plant-eater may have relied on camouflage for safety.



MONSTER FACTS

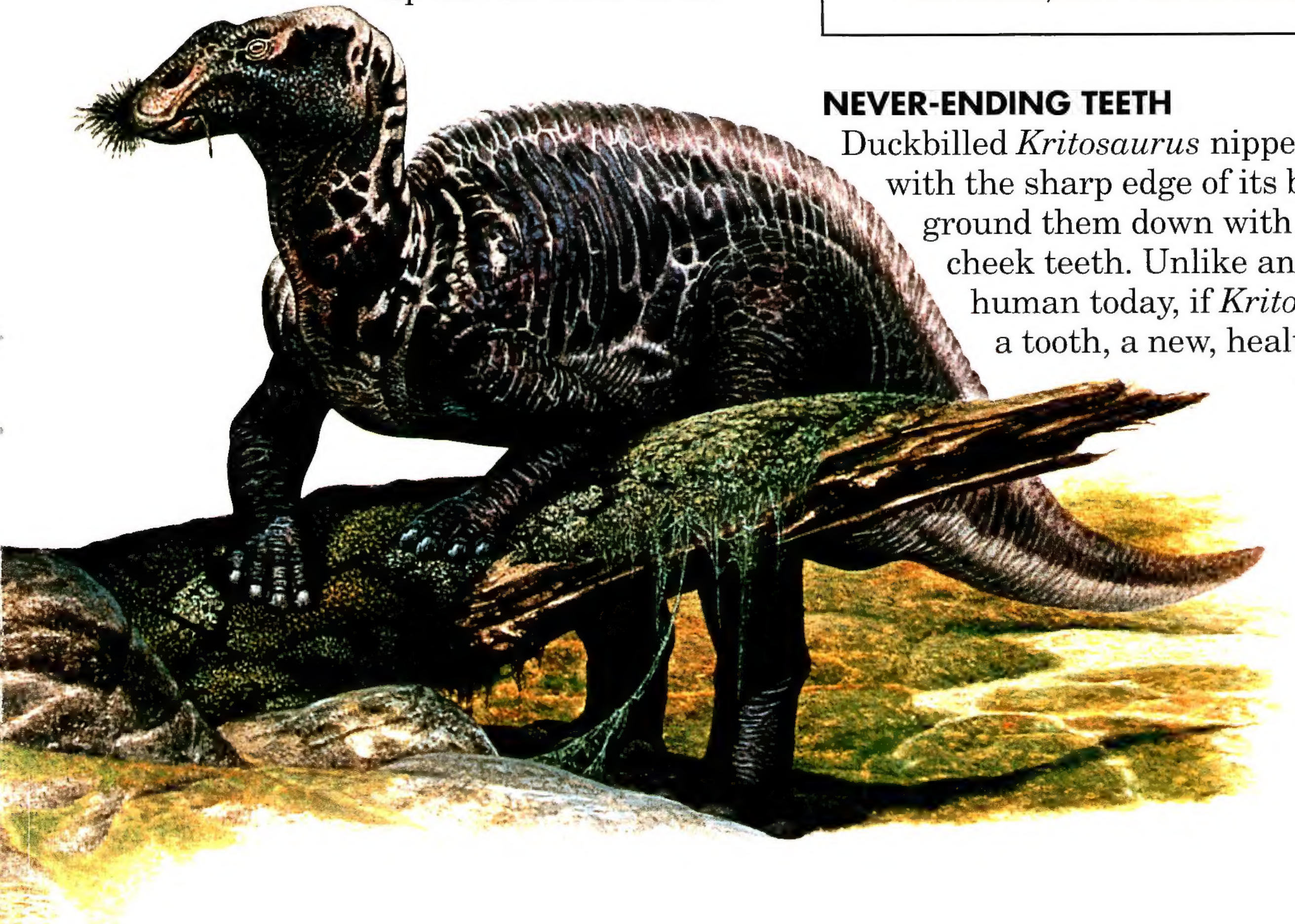
- **NAME:** *Kritosaurus* (cry-toh-saw-rus) means 'noble reptile'
- **SIZE:** up to 9m long
- **FOOD:** plants
- **LIVED:** about 75 million years ago in the Late Cretaceous Period in Alberta, Canada and New Mexico, USA. Also Mexico and Argentina

DINO DISGUISE

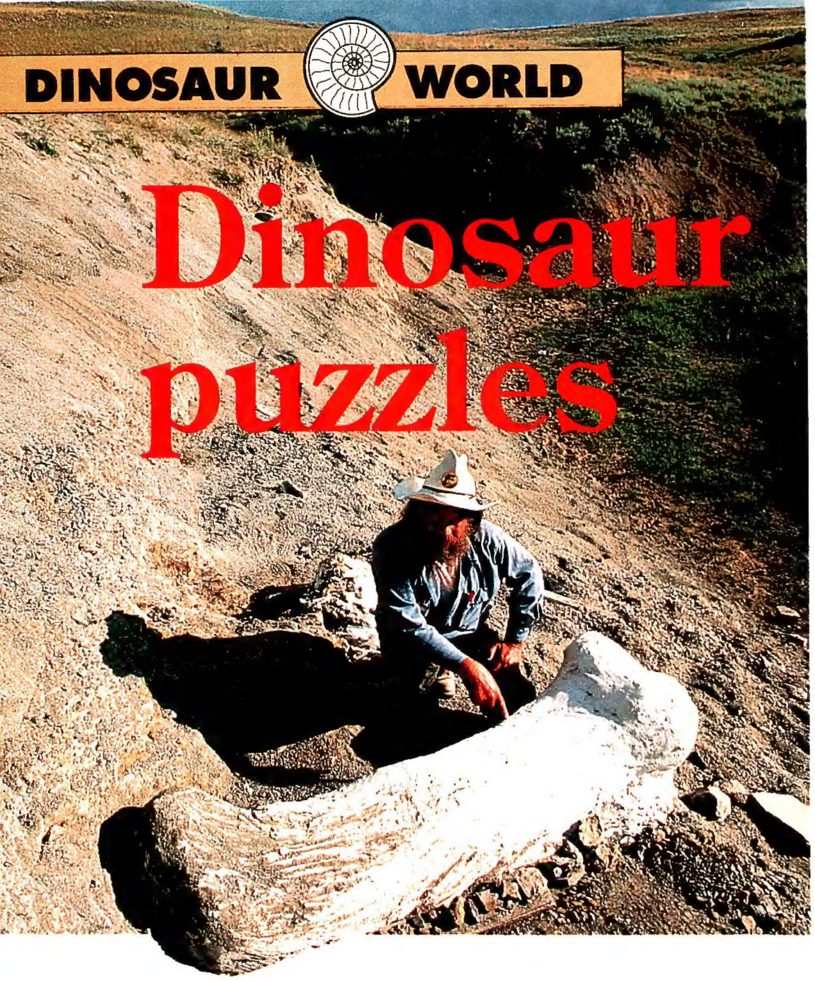
When it stood still, *Kritosaurus*' scaly skin probably merged into the background of dappled greens as do some snakes today. Perhaps this saved it from the jaws of its enemies. *Kritosaurus* was as heavy as two rhinoceroses and walked on two or four legs. It had a narrow head with a bump on top and no front teeth.

NEVER-ENDING TEETH

Duckbilled *Kritosaurus* nipped off shoots with the sharp edge of its beak and ground them down with rows of cheek teeth. Unlike an adult human today, if *Kritosaurus* lost a tooth, a new, healthy one grew in its place.



Dinosaur puzzles



Imagine that you have been given a model dinosaur kit. It has plastic bones to glue together. Great!

But your dog eats the instructions and some of the plastic bones. Then your cat steals the other bones, chews them up, and buries them in the garden. You are now in the same position as a real dinosaur fossil-hunter. You have to work out where to dig.

BITS AND PIECES

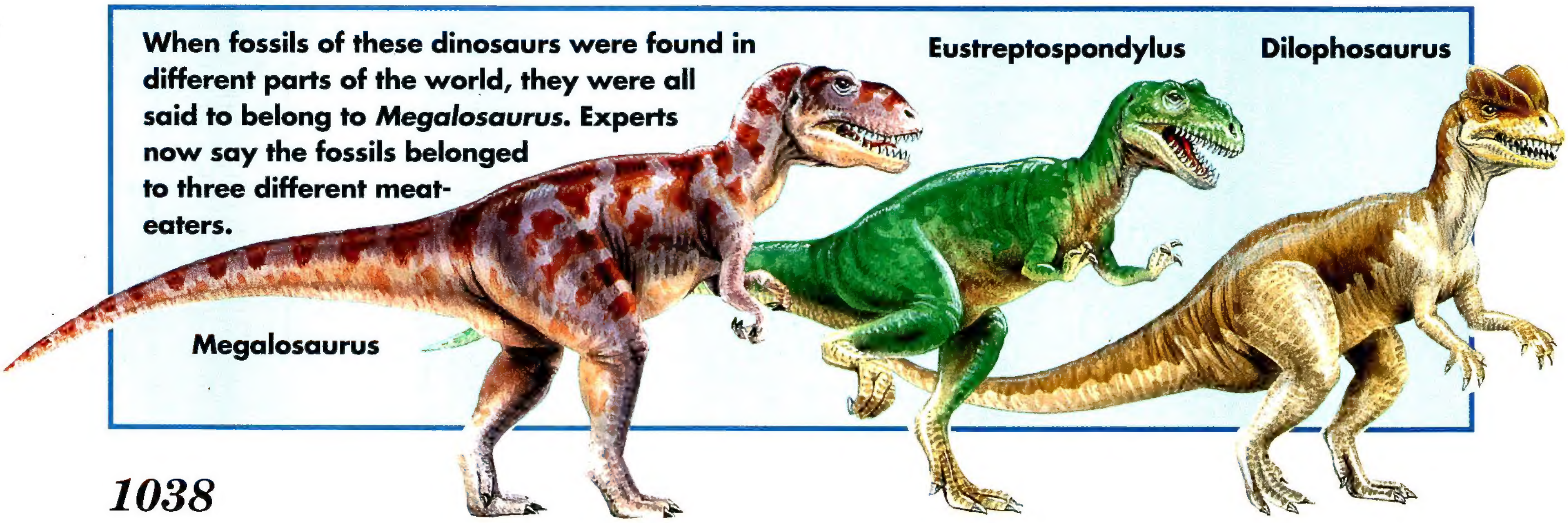
When you find the fossils, they are damaged. Many of the bones are missing and you have no instructions on how to put together the ones you have found. But that's the fun of being a dinosaur expert – trying to solve the puzzles!

MEGA MYSTERY

Megalosaurus was the first dinosaur to be described and named about 170 years ago. Early dinosaur expert William Buckland decided that the bits of bone belonged to a 7m-long, meat-eating dinosaur. However, after that, every time scientists found another fossil they thought belonged to a meat-eating dinosaur, they called it *Megalosaurus*. Gradually, 'megalosauruses' sprang up in France, Germany, North America, England and even Australia. Could the same dinosaur have lived in all these places?

WHAT'S IN A NAME?

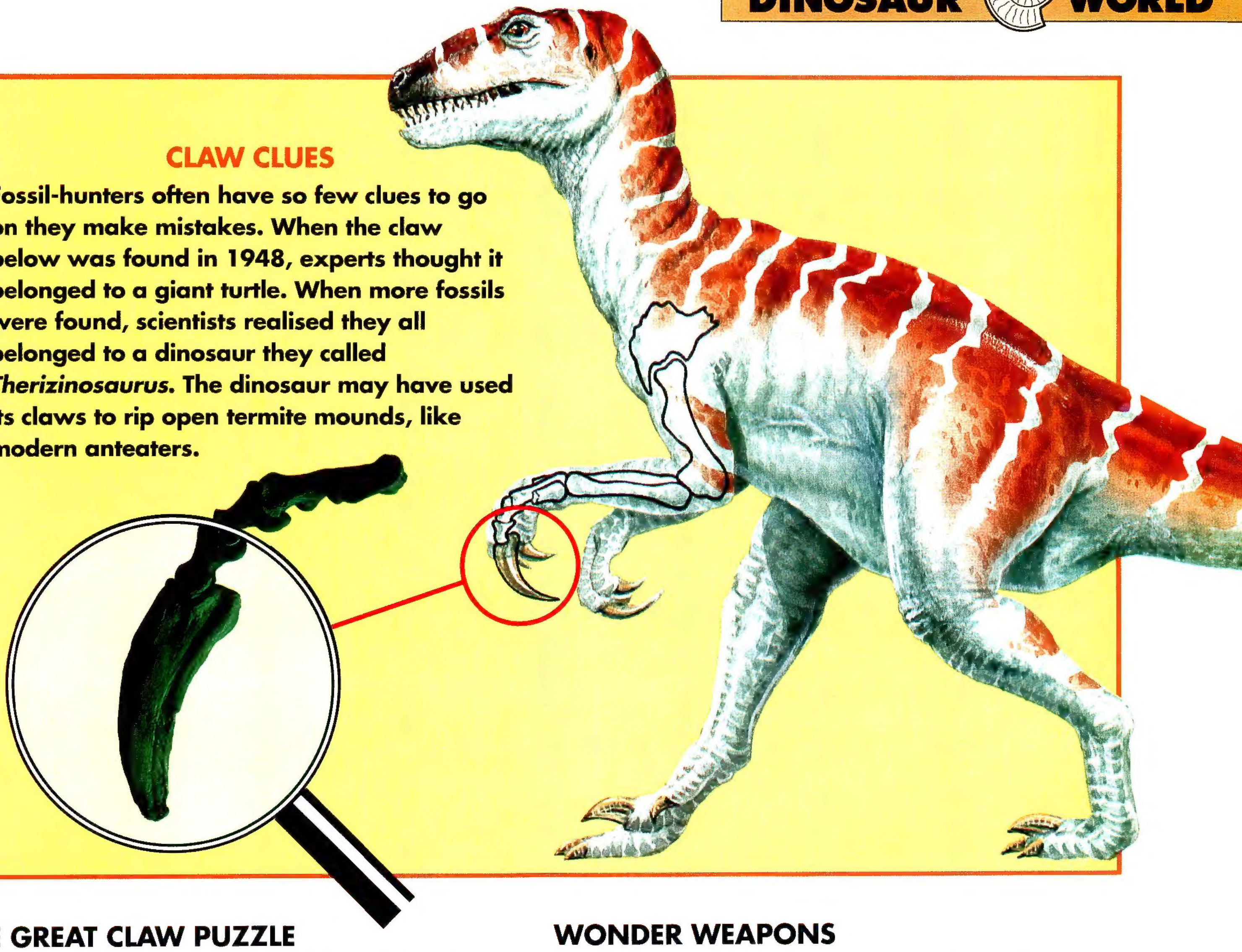
With a puzzle like this, it is always worth taking another look at the fossils. After more studies of the ones found in France and Oxford, England, the French version was renamed *Priveteausaurus* and the Oxford one was called *Eustreptospondylus*. And when a much better fossil was found that had two V-shaped head crests, the American version became *Dilophosaurus*.



When fossils of these dinosaurs were found in different parts of the world, they were all said to belong to *Megalosaurus*. Experts now say the fossils belonged to three different meat-eaters.

CLAW CLUES

Fossil-hunters often have so few clues to go on they make mistakes. When the claw below was found in 1948, experts thought it belonged to a giant turtle. When more fossils were found, scientists realised they all belonged to a dinosaur they called *Therizinosaurus*. The dinosaur may have used its claws to rip open termite mounds, like modern anteaters.



THE GREAT CLAW PUZZLE

In 1948 fossil-hunters found some huge claws that were over 70cm long, in the Gobi Desert, Mongolia. Here was a big puzzle! Some people suggested that they belonged to a giant turtle. Later expeditions found more of the great claws, plus some bones, and a tooth that showed the animal was a meat-eater. The limb bones definitely belonged to a two-legged dinosaur, not a turtle. With these extra parts, the claws seemed to be from the hands. But what were they for?

PIN THE CLAW ON THE DINOSAUR

Scientists called the mystery animal *Therizinosaurus*, meaning 'scythe reptile' after its curved claws. No other dinosaur had such vicious claws. Even those of 'Claws' *Baryonyx* were only half as long.

WONDER WEAPONS

What did *Therizinosaurus* use these gruesome weapons for? Tearing at its prey, like *Deinonychus* did with its foot claws? Or … another puzzle!

IT'S A FACT

YOU COULD GROW CLAWS

If you never cut your nails, they might grow to 70cm long. But they would look really strange and always get in the way! Dinosaur claws grew in much the same way as your nails and were even made of the same substance, called keratin. They were the end bones of their fingers or toes.

MIXED-UP-OSAUR

In the1970s, an expedition to Mongolia came back with puzzles as well as bones. Among them were the fossils of some misfit dinosaurs called segnosaurs, or 'slow reptiles'. The skeletons of segnosaurs seem to be made up of a mixture of different parts of other dinosaurs.

FAMILY BUSINESS

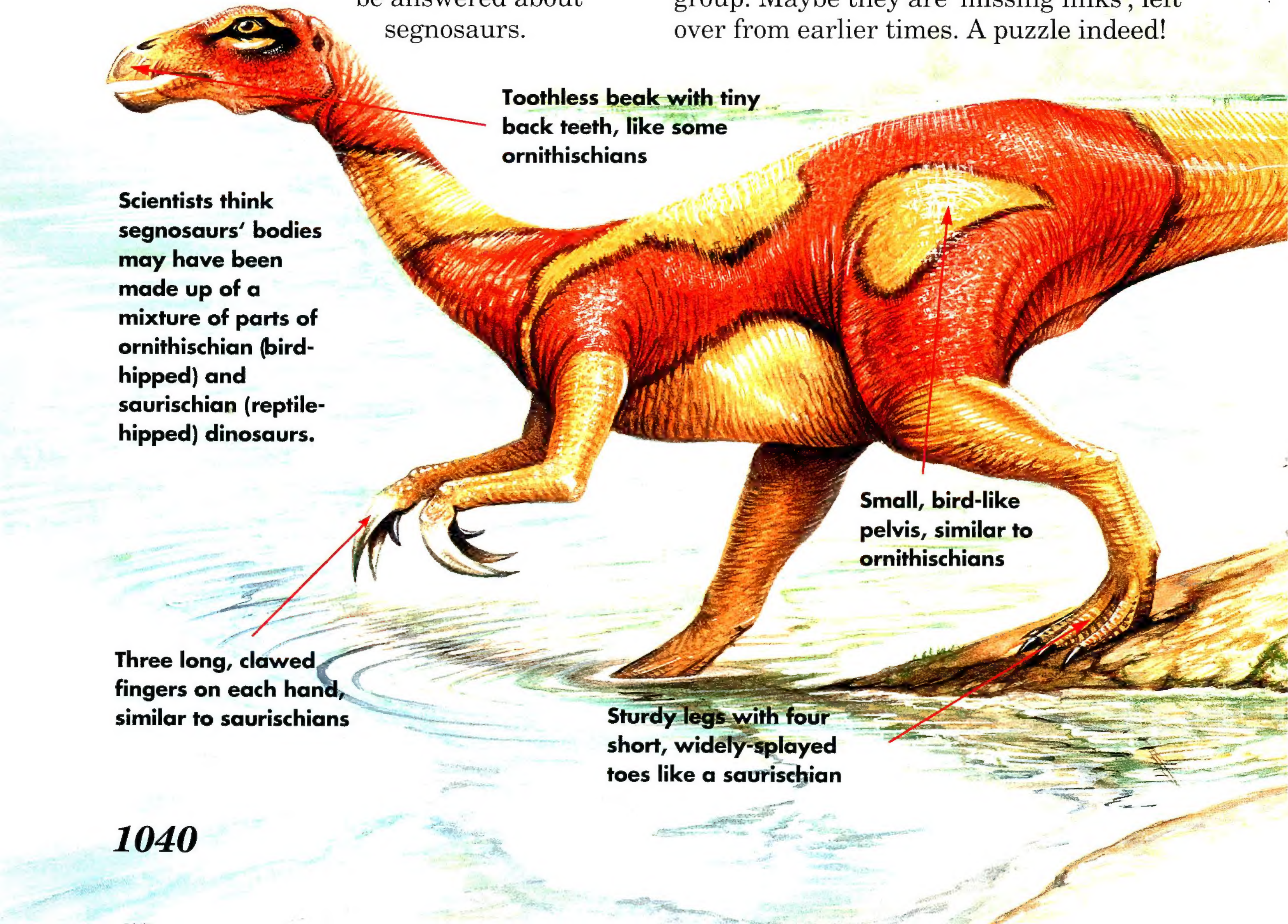
At about 7m long, the slow-moving, small-toothed segnosaur was not a fierce killer. Some scientists think it had a specific diet. Maybe its tiny, pointed teeth were used for catching slippery fish. Perhaps its long finger claws were for defence. Its broad feet may have looked like flippers – the sign of a swimmer. There are still lots of questions to be answered about segnosaurs.

Is it true that some dinosaurs had three legs?

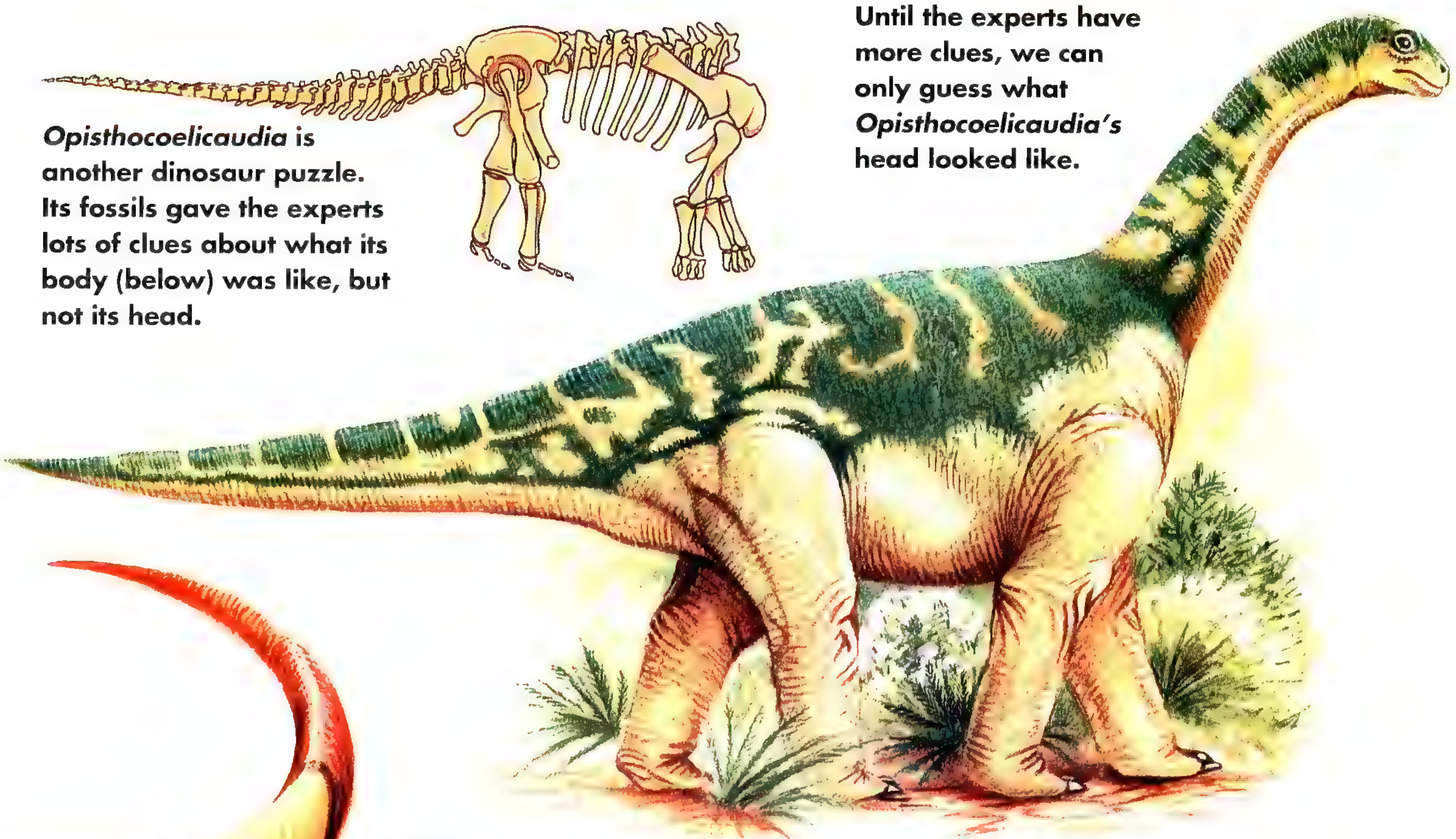
Not exactly. But some dinosaurs may have reared up on their back two legs, to reach for leaves high up in trees. As a dinosaur did so, it leaned back on its strong tail, using it as a 'third leg'. *Opisthocoelicaudia* may have been one of these dinosaurs that used the so-called tripodal posture, or 'tripod stance'. The bones of its tail were linked by ball-and-socket joints, which would provide a strong third leg when rearing up to feed.

MISSING LINKS

Segnosaurs are difficult to fit into the dinosaur family tree. They are usually seen as theropods from the saurischian group. Maybe they are 'missing links', left over from earlier times. A puzzle indeed!


Toothless beak with tiny back teeth, like some ornithischians
Scientists think segnosaurs' bodies may have been made up of a mixture of parts of ornithischian (bird-hipped) and saurischian (reptile-hipped) dinosaurs.
Small, bird-like pelvis, similar to ornithischians
Three long, clawed fingers on each hand, similar to saurischians
Sturdy legs with four short, widely-splayed toes like a saurischian

Opisthocoelicaudia is another dinosaur puzzle. Its fossils gave the experts lots of clues about what its body (below) was like, but not its head.



Until the experts have more clues, we can only guess what _Opisthocoelicaudia's_ head looked like.

MISSING HEAD

Another Mongolian puzzle is headless *Opisthocoelicaudia*. Its fossils were found in 1965, embedded in rocks that were 70 million years old. It was about 12m long, heavily built and was probably a sauropod in the same group as *Camarasaurus*. It had dumpy legs and a short, stiff tail to lean on when it reared up on its back legs. But one vital clue was missing – the head.

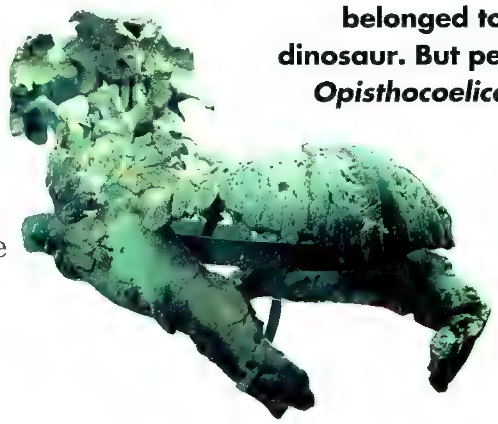
SKULL SEARCH

However, two dinosaur skulls were found nearby. They had nostrils on top, eyes set far back and a few peg-like teeth at the front of the jaws. The skulls seemed to belong to a longer, heavily-built type of sauropod, such as *Diplodocus*. One of these head-only dinosaurs was named *Nemegtosaurus* and the other was called *Quaesitosaurus*.

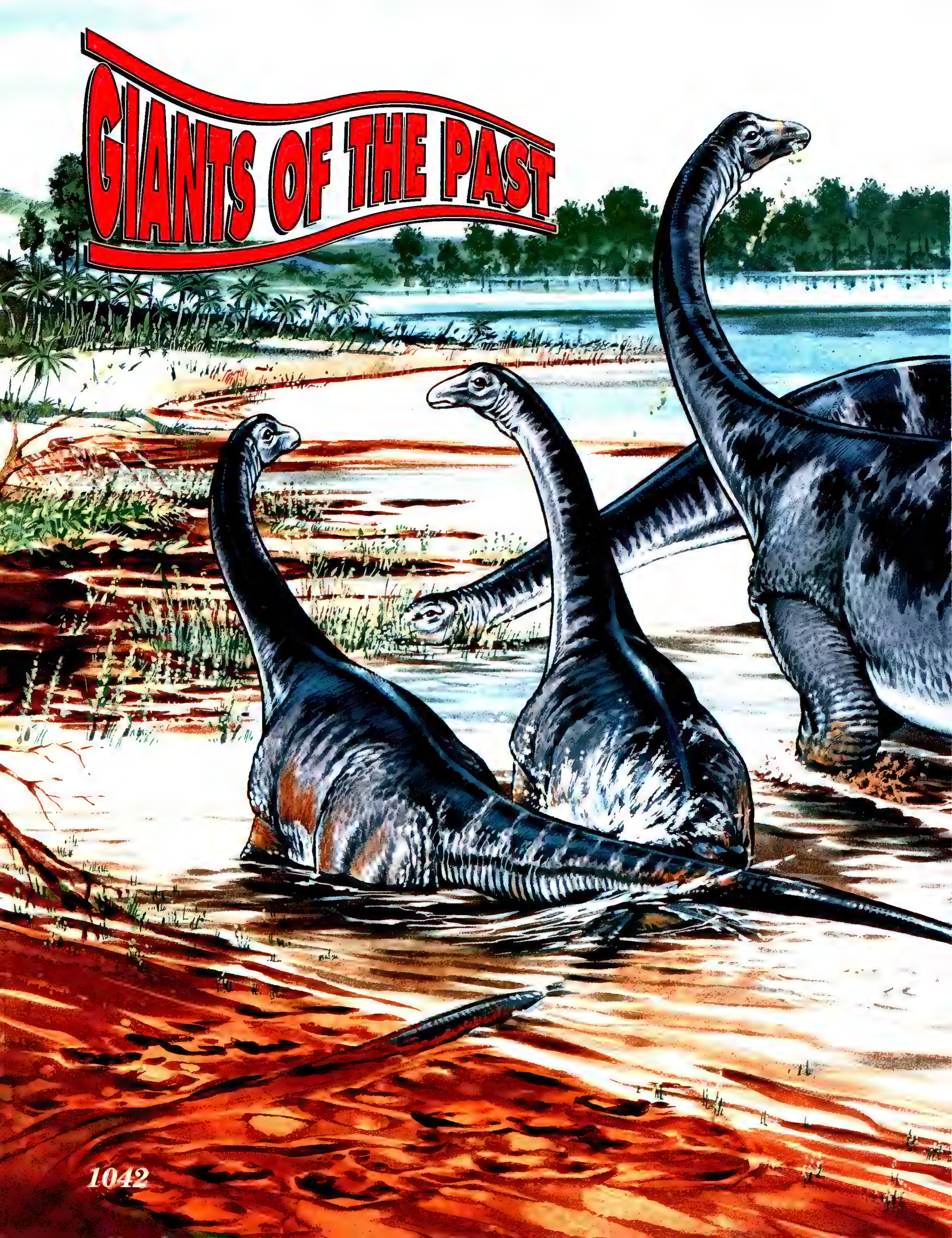
STRONG EVIDENCE

Could either of these heads belong to the *Opisthocoelicaudia* body? Possibly. But scientists don't like to believe that a head fits on to a body, unless it is obviously the right one! The evidence must be strong. So we will have to wait until more fossils are found before this and hundreds of other mysteries can be solved.

The skulls of _Quaesitosaurus_ (below) and _Nemegtosaurus_ were found together. No-one has ever suggested they really belonged to a two-headed dinosaur. But perhaps one was _Opisthocoelicaudia's_ skull as the headless skeleton of this dinosaur was found nearby.



GIANTS OF THE PAST

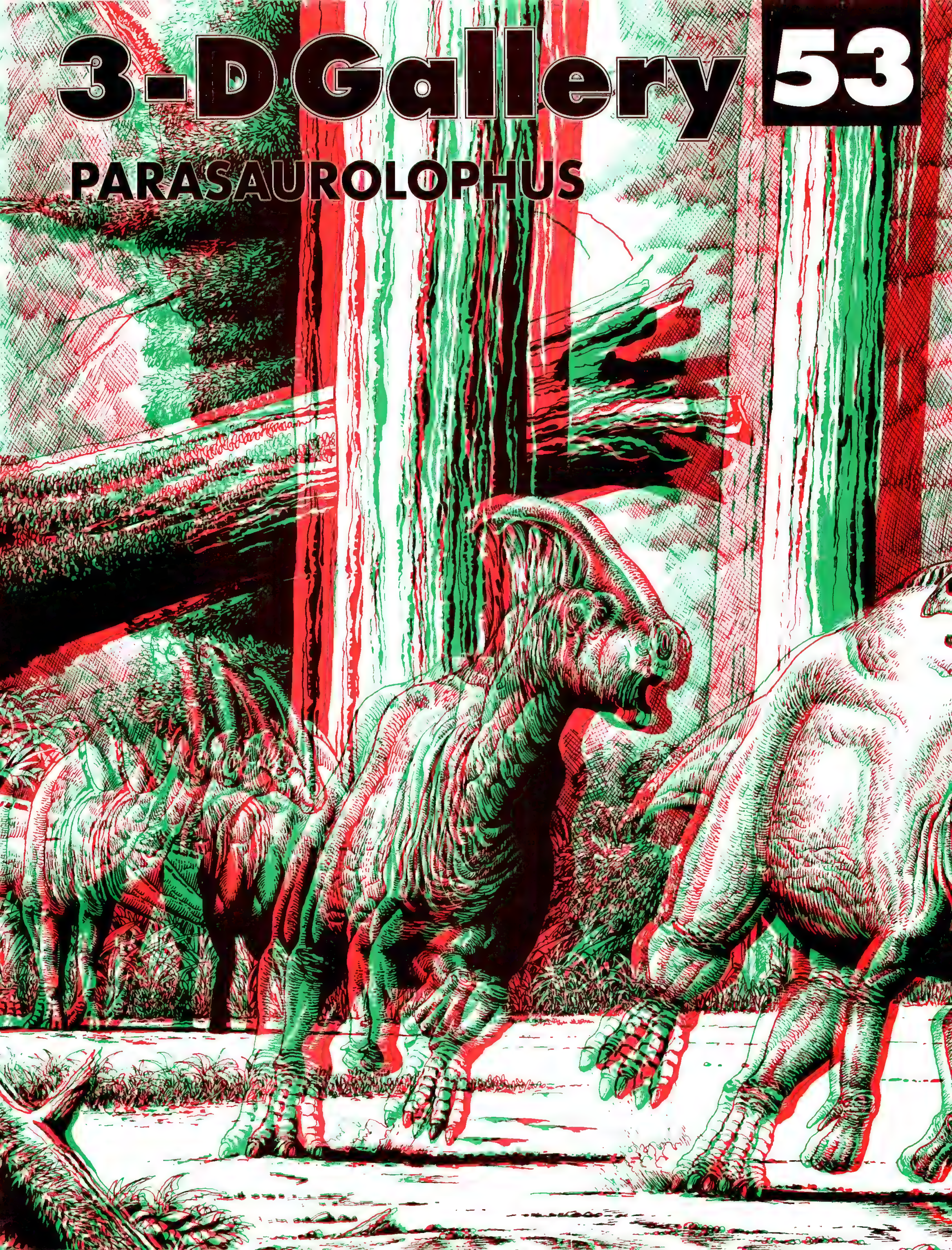


CETIOSAURUS

Dusk descends over the marshy plains of Jurassic England. A herd of *Cetiosaurus* has waded into a swamp to wallow like elephants. One enjoys a leafy snack as the others swish their tails through the water which feels cool after the heat of the day. For the moment, all is peaceful. But should a ravenous carnosaur appear, the *Cetiosaurus* will lash out with their huge tails to protect themselves.

3-D Gallery 53

PARASAUROLOPHUS



With a huge bellow, a male *Parasaurolophus* charges after a young buck which has strayed too close to the females of the herd grazing nearby. The terrified buck tears off at top speed. It wants to escape a deadly clash of crests with the older male.

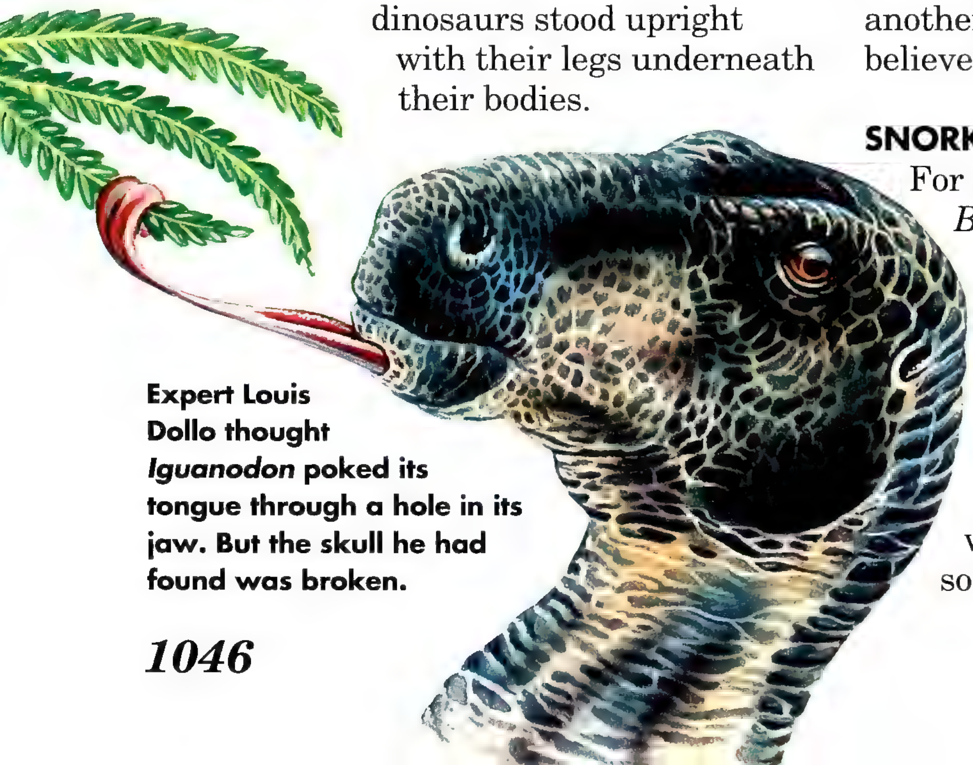
Strange theories

Over the years, scientists have come up with some pretty strange theories about what dinosaurs looked like and how they lived. Here are some of the oddest ideas people have had.

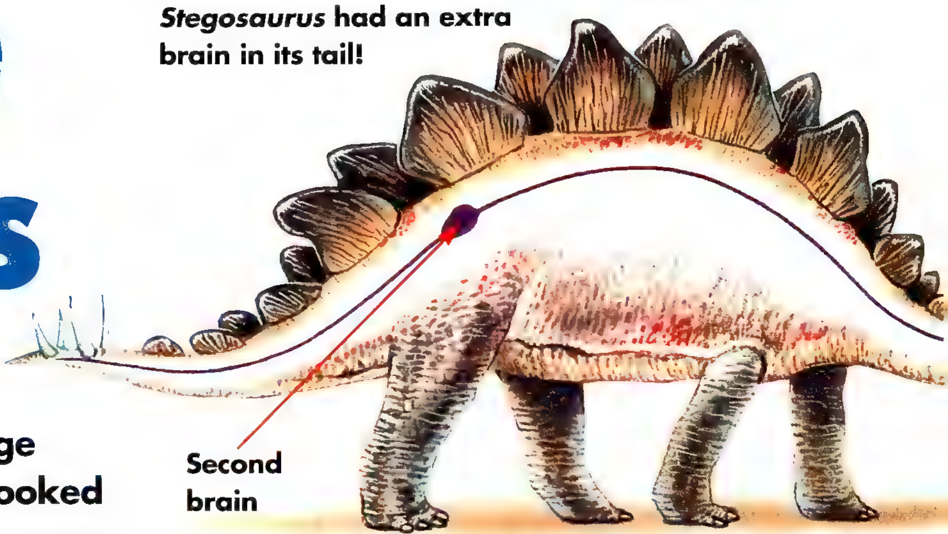
Finding out about dinosaurs that lived millions of years ago isn't always easy when scientists only have a few old bones to work from. Sometimes they get it wrong.

LIZARD LEGS

For a long time it was thought that a dinosaur's legs were like a lizard's and bent outwards on each side. By studying the shape of dinosaur leg bones, experts then proved that dinosaurs stood upright with their legs underneath their bodies.



Expert Louis Dollo thought *Iguanodon* poked its tongue through a hole in its jaw. But the skull he had found was broken.



It was once believed that *Stegosaurus* had an extra brain in its tail!

BRAINS IN THEIR TAILS

One of the weirdest ideas ever was that stegosaurs had brains in their tails. In the 19th century, expert Othniel Marsh was working on a *Stegosaurus* skeleton when he discovered a large space in the hip region of the animal's spine. He believed this area contained a mass of nerve tissue.

VERY WRONG!

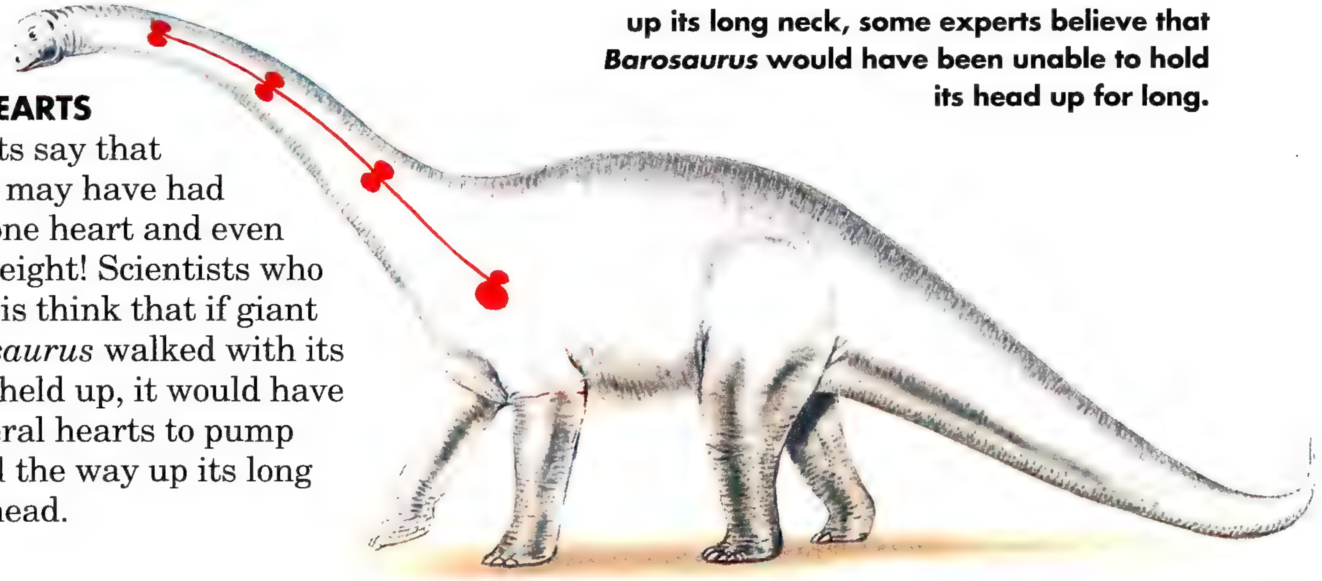
Stegosaurus had a very small brain compared with other dinosaurs. So Othniel Marsh thought the dinosaur may have had another brain in its spine. Most people now believe that Marsh was wrong.

SNORKELLING DINOSAUR

For a long time people thought *Brachiosaurus* was a wader that spent most of its time in water. Scientists thought the nostrils on its head worked like a snorkel, allowing it to breathe while the rest of its body was underwater. We now know this isn't true. *Brachiosaurus'* lungs and rib cage were too weak to cope underwater, so it must have lived on land.

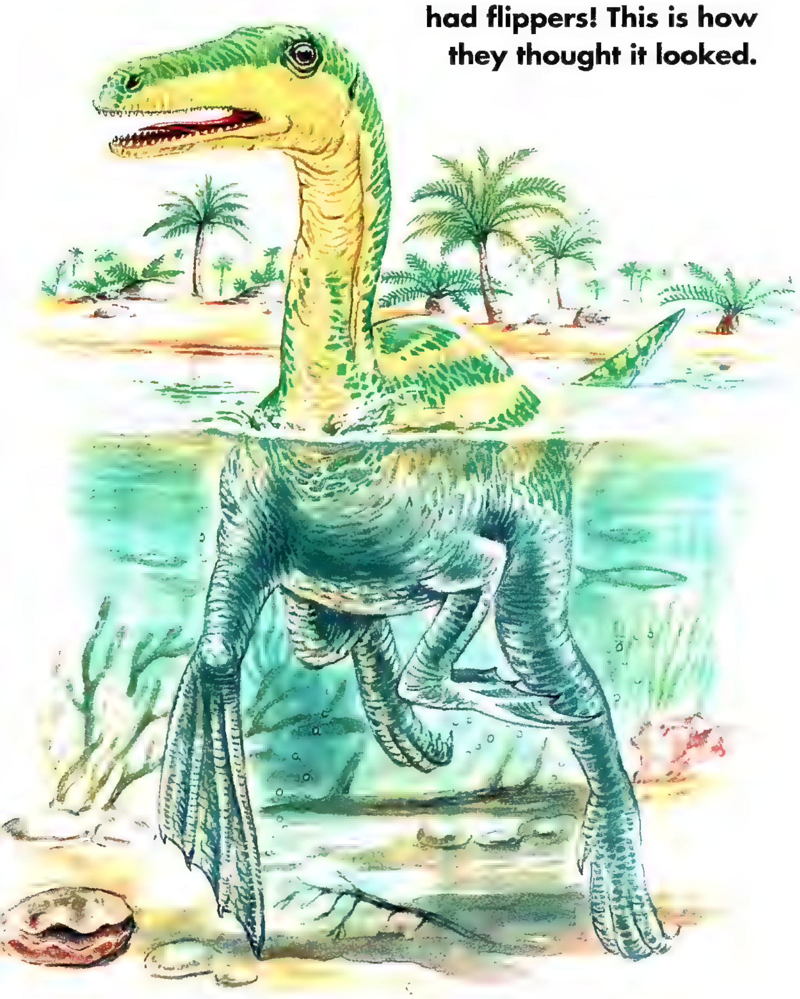
KING OF HEARTS

Some experts say that *Barosaurus* may have had more than one heart and even as many as eight! Scientists who believe this think that if giant *Barosaurus* walked with its head held up, it would have needed several hearts to pump the blood all the way up its long neck to its head.



Without extra hearts to pump blood all the way up its long neck, some experts believe that *Barosaurus* would have been unable to hold its head up for long.

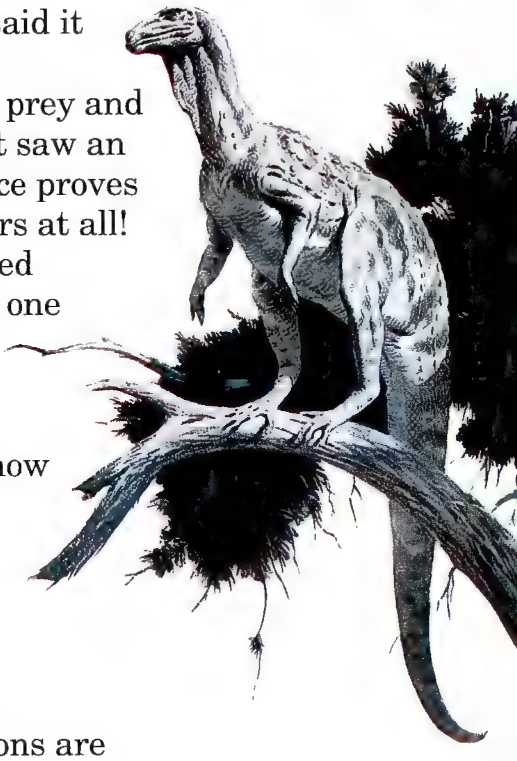
Until recently, scientists believed *Compsognathus* had flippers! This is how they thought it looked.



MORE ODD IDEAS

When a new skeleton of *Compsognathus* was found in France in 1972, some experts thought it had arms like flippers. They said it probably swam in lagoons, looking for prey and paddling off when it saw an enemy. New evidence proves it didn't have flippers at all! Other people believed *Hypsilophodon* had one toe which pointed backwards like a bird's, helping it to grip branches. We now know this isn't true and there's no evidence it lived in trees.

Hypsilophodon was once thought to have a bird-like toe pointing backwards and to live in trees.



WHAT NEXT?

As further expeditions are launched and new technology is used, there will be more dinosaur theories. Perhaps there are stranger ones to come...

Bridges and cranes

How did a dinosaur the height of a three-storey house manage to support its giant body?

Enormous plant-eaters such as *Diplodocus* were the biggest land animals ever. If they had grown any larger, they would probably have been too huge to move and their feet would have sunk into the ground!

SPREADING THE LOAD

Such vast dinosaurs needed an extra-strong arrangement of bones and muscles. They were constructed rather like bridges and cranes are today. A modern suspension bridge must be able to carry its own weight as well as the traffic that uses it.

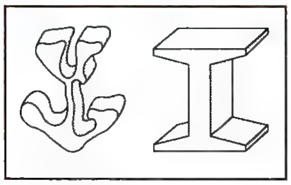
BRIDGING BONES

The road across a suspension bridge hangs from cables. The cables are carried by two towers firmly anchored to the ground. The design of a *Diplodocus* backbone resembled the structure of a suspension bridge. Its legs were like the towers of the bridge and its backbone was like the road running between them. Just as a suspension bridge is supported by strong cables slung between the towers, the dinosaur's backbone was supported by powerful muscles and ligaments.

IT'S A FACT

LEGGING IT

None of the biggest dinosaurs would have been able to move much faster than a slow walking pace. A galloping *Brachiosaurus* would probably have broken its legs because they would not have been able to take the extra pressure of its huge body moving at speed.



Cross-sections of a *Brachiosaurus* spinal bone (above left) and a man-made steel girder (above right) show how both are made to be strong but light.

POWERHOUSE

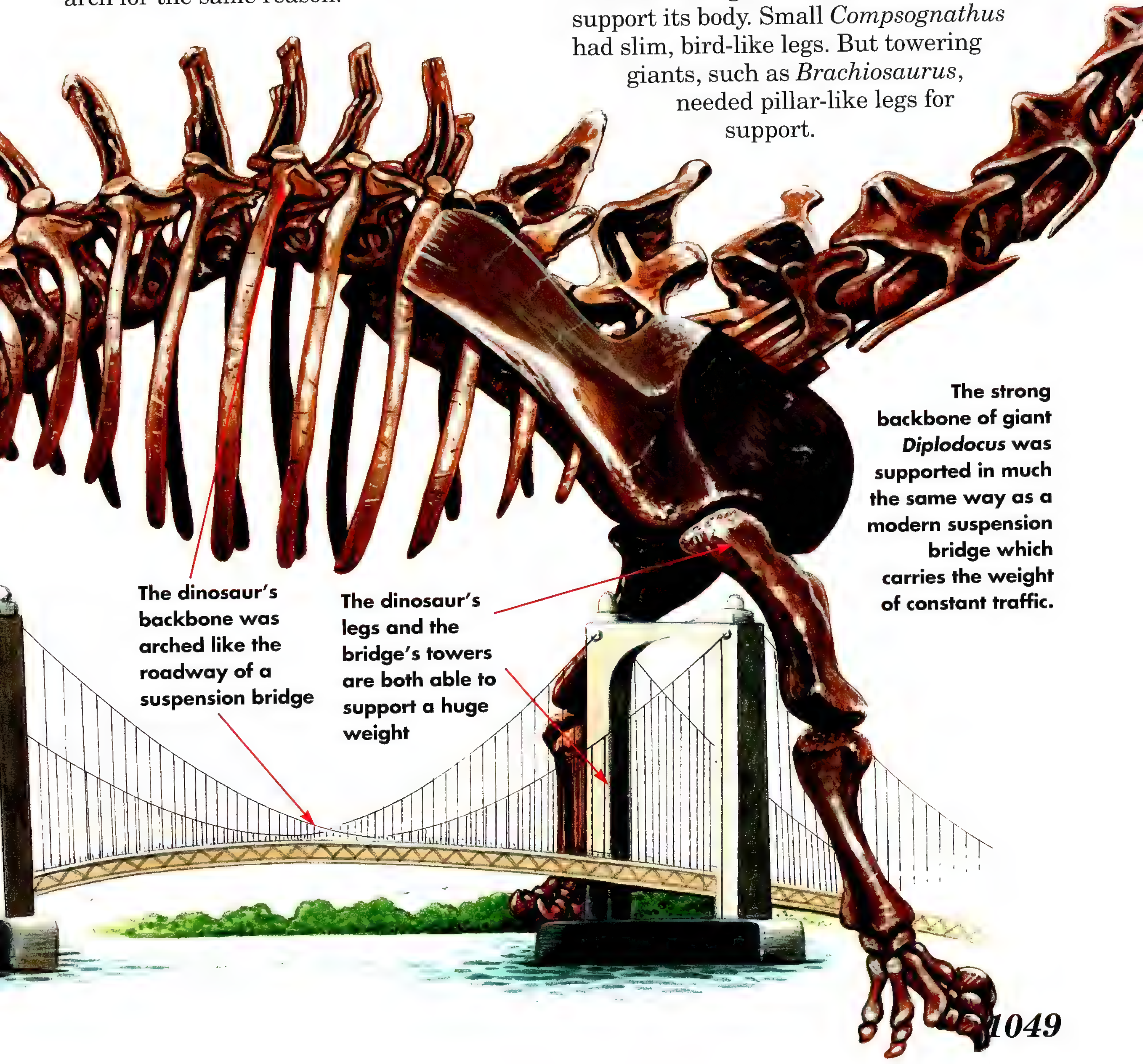
Diplodocus' mighty backbone was the dinosaur's powerhouse. It had to be extra-strong to prevent the massive body from collapsing, but flexible enough to allow it to move. The backbone was slightly arched between the shoulders and the hips to help spread the weight. The roadway of a suspension bridge is built with a slight arch for the same reason.

WEIGHT SAVING

The backbones of the giant plant-eaters were hollowed out for lightness. A cross-section of a *Brachiosaurus* spinal bone shows that it had a thin core and deeply hollowed sides. It looks like a man-made steel girder – strong but light.

PILLARS OF SUPPORT

An animal's legs must be strong enough to support its body. Small *Compsognathus* had slim, bird-like legs. But towering giants, such as *Brachiosaurus*, needed pillar-like legs for support.



The dinosaur's backbone was arched like the roadway of a suspension bridge

The dinosaur's legs and the bridge's towers are both able to support a huge weight

The strong backbone of giant *Diplodocus* was supported in much the same way as a modern suspension bridge which carries the weight of constant traffic.

The neck of a giant dinosaur like *Diplodocus* (left) or *Brachiosaurus* worked like the arm of a crane.

TAKING THE STRAIN

The neck of a giant dinosaur was like a modern mobile crane. *Brachiosaurus* was the tallest known dinosaur. If it stretched its neck straight up, it could have looked over the roof of a three-storey building. Lifting up its long neck to feed high in the trees, or lowering it to scoop up water plants, must have needed a lot of muscle power.

NECK CRANER

Brachiosaurus' neck worked like the tall steel beam of the arm of a crane. The long muscles, which ran down the neck, operated like the cables of the crane's arm to make it move. Also, *Brachiosaurus'* massive body prevented it from being top heavy, just as the weighty base of a crane stops it from falling over.

STRONG BUT LIGHT

A *Brachiosaurus* neck was spectacularly long but surprisingly light. The bones in it were very strong. They had a hollow, honeycomb-like structure. The dinosaur needed a neck that was strong but light so that it could move it about easily.

IT'S A FACT

NECK RECORDS

Mamenchisaurus had the longest neck of any animal that has ever lived. It's neck was 10 metres long, the same length as the rest of its body. *Mamenchisaurus'* neck had 19 vertebrae – more than any other dinosaur.

UPWARDLY MOBILE

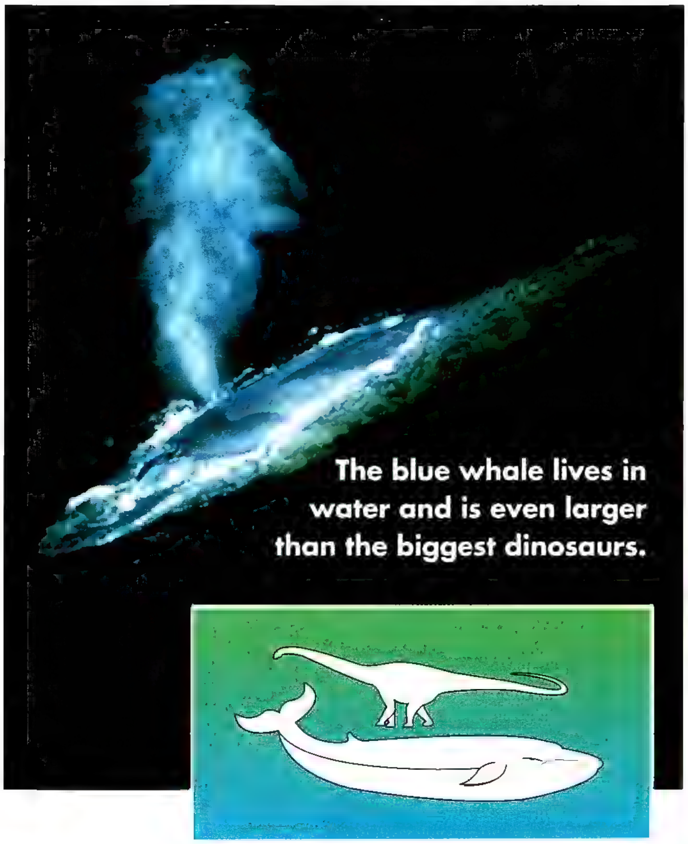
A modern giraffe has a long neck like *Brachiosaurus*, which it uses to browse among the tree tops. But the two creatures look very different. A giraffe can chew its food, so it does not need a huge belly. *Brachiosaurus* swallowed its food whole, and digested it inside its bulky body.

FLOATING GIANTS

The largest dinosaurs were the biggest animals ever to live on land. But they were outgrown by sea creatures. The blue whale can only support its huge body in water. Experts once thought the biggest dinosaurs lived in water, using their necks like snorkels to breathe. Scientists now know all dinosaurs lived on land, but fossil footprints show the large plant-eaters could also swim. They may have pushed themselves along using their front feet.

DESIGN IDEAS

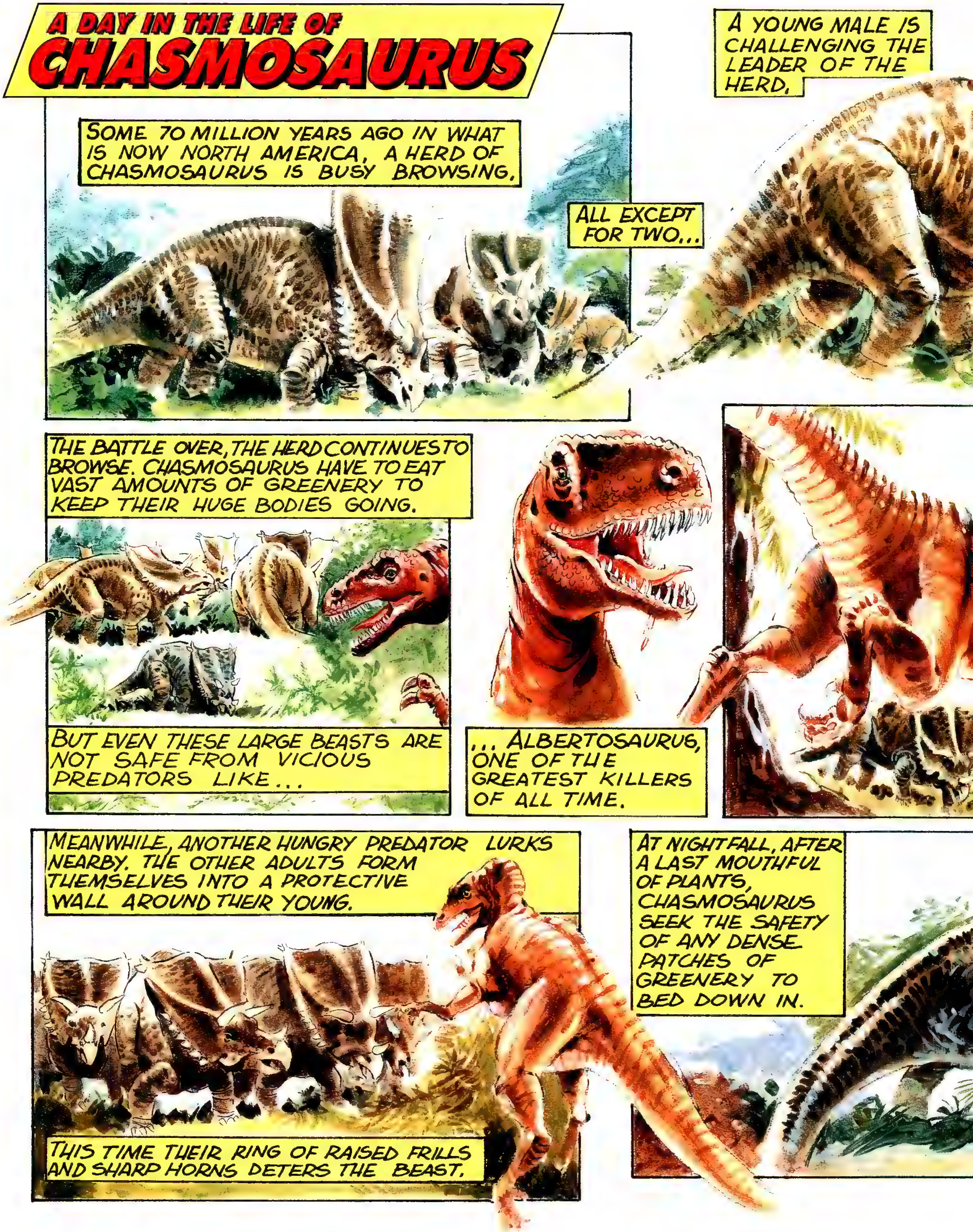
Maybe the engineers who designed today's huge bridges and cranes were dinosaur detectives too and got their ideas from studying the skeletons of creatures like *Diplodocus* and *Brachiosaurus*!

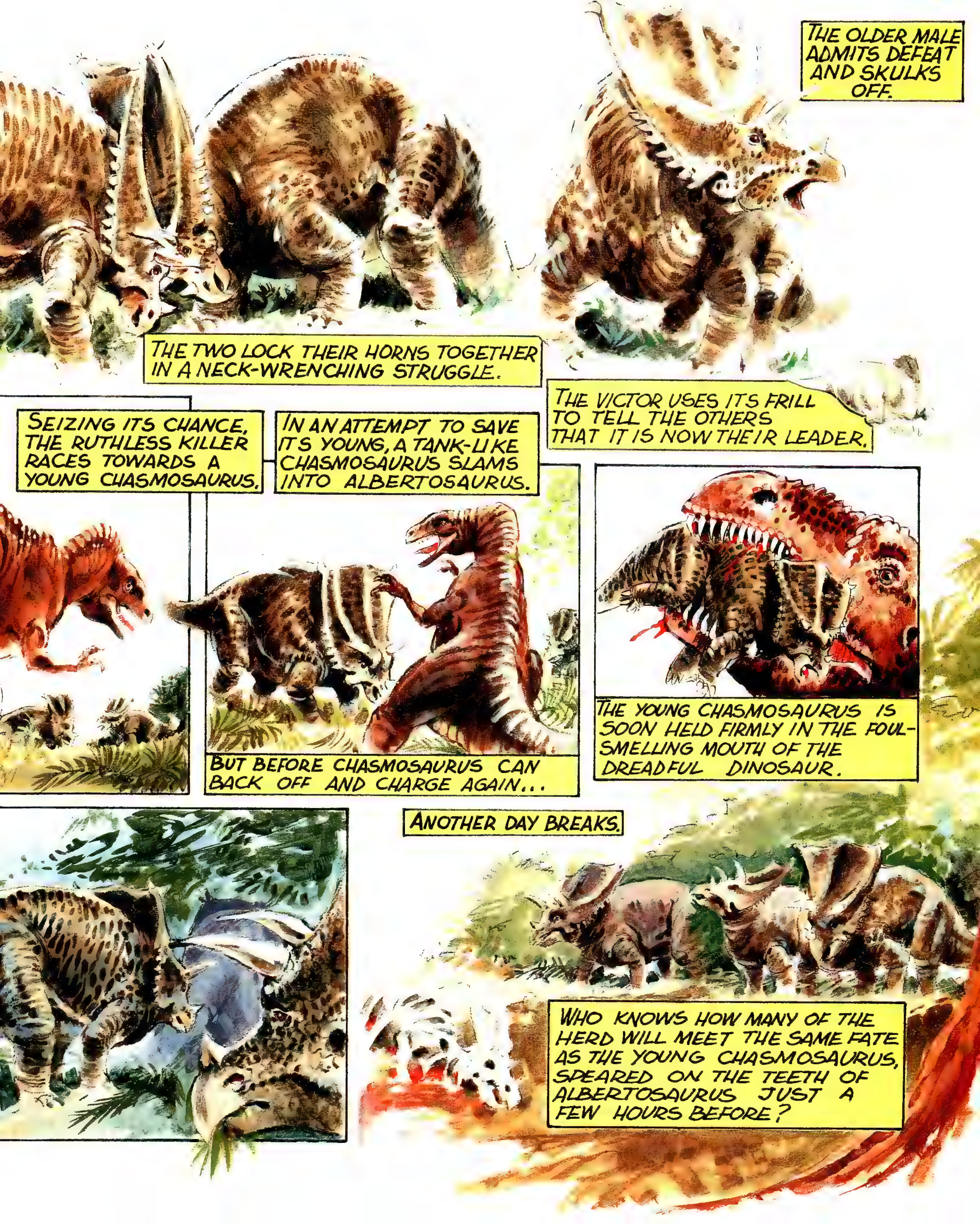


The blue whale lives in water and is even larger than the biggest dinosaurs.

Sauropods like *Diplodocus* did not live in water but probably swam.

A DAY IN THE LIFE OF CHASMOSAURUS


SOME 70 MILLION YEARS AGO IN WHAT IS NOW NORTH AMERICA, A HERD OF CHASMOSAURUS IS BUSY BROWSING.
ALL EXCEPT FOR TWO...
A YOUNG MALE IS CHALLENGING THE LEADER OF THE HERD.
THE BATTLE OVER, THE HERD CONTINUES TO BROWSE. CHASMOSAURUS HAVE TO EAT VAST AMOUNTS OF GREENERY TO KEEP THEIR HUGE BODIES GOING.
BUT EVEN THESE LARGE BEASTS ARE NOT SAFE FROM VICIOUS PREDATORS LIKE...
... ALBERTOSAURUS, ONE OF THE GREATEST KILLERS OF ALL TIME.
MEANWHILE, ANOTHER HUNGRY PREDATOR LURKS NEARBY. THE OTHER ADULTS FORM THEMSELVES INTO A PROTECTIVE WALL AROUND THEIR YOUNG.
THIS TIME THEIR RING OF RAISED FRILLS AND SHARP HORNS DETERS THE BEAST.
AT NIGHTFALL, AFTER A LAST MOUTHFUL OF PLANTS, CHASMOSAURUS SEEK THE SAFETY OF ANY DENSE PATCHES OF GREENERY TO BED DOWN IN.


THE TWO LOCK THEIR HORNS TOGETHER IN A NECK-WRENCHING STRUGGLE.
THE OLDER MALE ADMITS DEFEAT AND SKULKS OFF.
THE VICTOR USES ITS FRILL TO TELL THE OTHERS THAT IT IS NOW THEIR LEADER.
SEIZING ITS CHANCE, THE RUTHLESS KILLER RACES TOWARDS A YOUNG CHASMOSAURUS.
IN AN ATTEMPT TO SAVE ITS YOUNG, A TANK-LIKE CHASMOSAURUS SLAMS INTO ALBERTOSAURUS.
BUT BEFORE CHASMOSAURUS CAN BACK OFF AND CHARGE AGAIN...
THE YOUNG CHASMOSAURUS IS SOON HELD FIRMLY IN THE FOUL-SMELLING MOUTH OF THE DREADFUL DINOSAUR.
ANOTHER DAY BREAKS.
WHO KNOWS HOW MANY OF THE HERD WILL MEET THE SAME FATE AS THE YOUNG CHASMOSAURUS, SPEARED ON THE TEETH OF ALBERTOSAURUS JUST A FEW HOURS BEFORE?

Improve and test your knowledge with...

DINO Fact File

Triceratops holds all the answers. See how you score in the quiz.

1 The first sauropod ever discovered was:
- a) *Stegosaurus*
- b) *Cetiosaurus*
- c) *Silvisaurus*

2 *Cetiosaurus'* bones were first identified as:
- a) whale bones
- b) giant human bones
- c) elephant bones

3 To make them lighter, most sauropods:
- a) had short tails
- b) went on a diet
- c) had a hollow backbone

4 *Kritosaurus* protected itself from attack by:
- a) displaying its beak
- b) using its natural camouflage
- c) swimming to safety

5 The name '*Eoraptor*' means:
- a) 'whale reptile'
- b) 'bird-like mimic'
- c) 'dawn hunter'

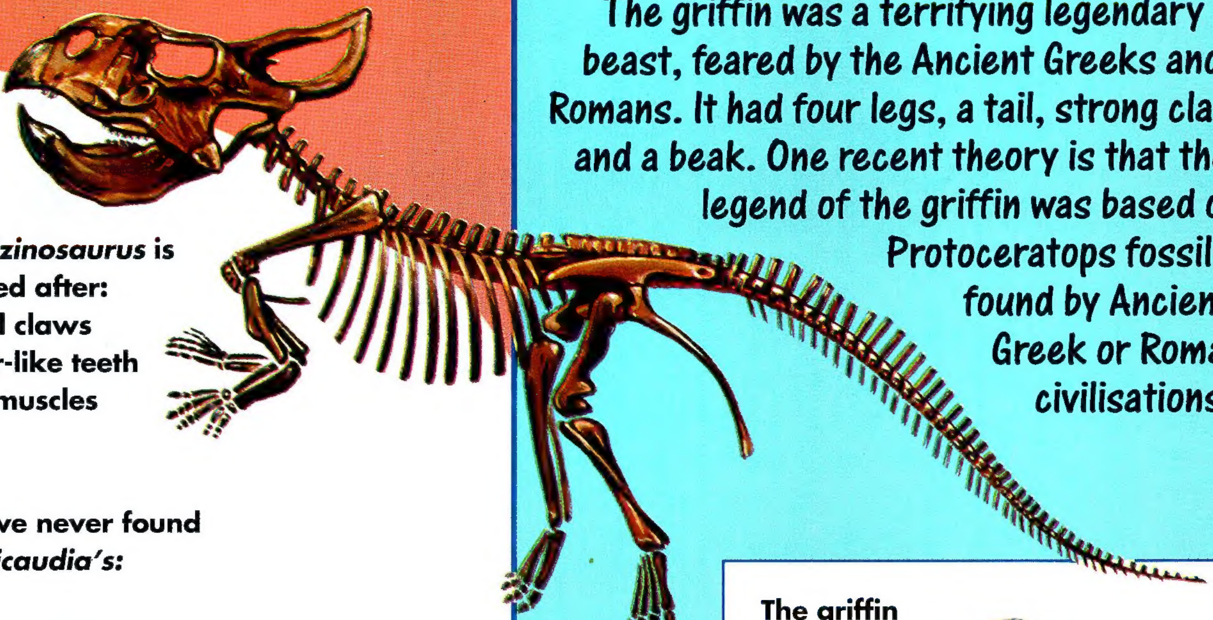
Shopping for fossils

In 1978, a shopkeeper from Montana, USA, was looking for some unusual rocks to sell when she came across some fossils of bones. Palaeontologist Jack Horner identified them as the remains of baby dinosaurs.

Dinosaur monument

Palaeontologist Earl Douglass was sponsored by the Carnegie Museum in Pittsburgh to find dinosaurs. Instead of digging up all the fossils he found for the museum, Douglass left some of them in the rock. Today people can visit the site, in Utah, USA, where many fossils are still embedded. The area is protected by a hangar made of steel and glass.

Protoceratops



Ancient legend

The griffin was a terrifying legendary beast, feared by the Ancient Greeks and Romans. It had four legs, a tail, strong claws and a beak. One recent theory is that the legend of the griffin was based on Protoceratops fossils found by Ancient Greek or Roman civilisations.

The griffin

6 ***Therizinosaurus*** **is named after:**

a) its curved claws
b) its scissor-like teeth
c) its thigh muscles

7 **Experts have never found *Opistocoelicaudia's*:**

a) leg bone
b) head
c) tail

8 ***Brachiosaurus'*** **neck was like:**

a) a spiral staircase
b) a jack-in-the-box
c) a mobile crane

9 ***Chasmosaurus*** **protected its young from predators by:**

a) standing in a circle around them
b) burying them in a hole
c) making them climb trees

10 ***Stegosaurus*** **had:**

a) eight hearts
b) one small brain
c) flippers for feet

Handy camels

American fossil-hunter Roy Chapman Andrews used camels as supply carriers on his expedition to the Gobi Desert in the 1920s. When his team ran out of packing materials for the fossils, they used camel hair instead.

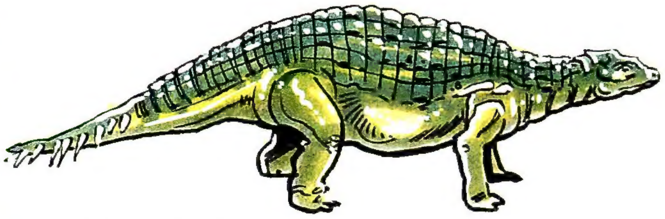
Dinosaur bed

When 23 small, well-preserved dinosaur skeletons were found in some cliffs on the Isle of Wight, UK, the area was called 'Hypsilophodon bed'. How this dinosaur bed was created is still a mystery. One theory is that the dinosaurs died and were buried by layers of quicksand between tides. These layers protected the fossils from the sea and weather.

Answers to the questions on inside back cover

SILVISAURUS **120 MYA**

About as long as a small car, *Silvisaurus* (sil-vee-saw-rus) was an armoured dinosaur from Kansas, USA. Unlike other nodosaurids, *Silvisaurus* had some small teeth at the front of its jaw. It was well protected by bony plates and spikes as it fed from low-growing plants. *Silvisaurus* means 'forest reptile'.



SPINOSAURUS **110 MYA**

Spinosaurus (spine-o-saw-rus) had a 'sail' of skin along its back supported by a fan-shaped row of spines. Its name means 'spiny reptile'. A flesh-eating dinosaur, *Spinosaurus* was the length of two elephants, with a long, powerful jaw and sharp teeth. It lived in northern Africa in the Cretaceous Period.

STAURIKOSAURUS **210 MYA**

Dangerous *Staurikosaurus* (stor-ik-oh-saw-rus) was a small, lightweight predator. It lived in the Late Triassic Period in Santa Maria, southern Brazil, and was named after a constellation of stars. About the size of a large dog, it sprinted after small mammals on long, slender legs. It used its five-fingered hands to grasp prey and its dagger-like teeth to tear the victim apart.

STEGOCERAS **75 MYA**

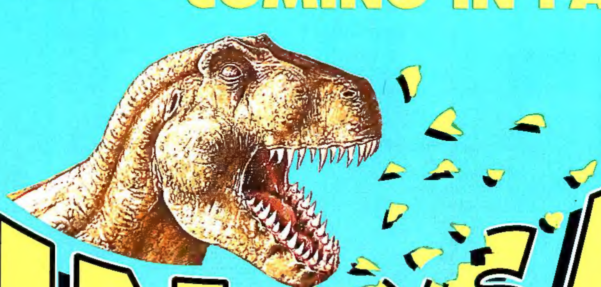
Stegoceras (steg-o-ser-as) was a two-legged, plant-eating dinosaur. Its thick skull was covered with bumps which formed a knobbly frill. *Stegoceras* lived in North America and north-west China in the Late Cretaceous Period and was about the size of a wolf. The dome of its head grew higher and thicker as it got older. Experts think that *Stegoceras* used its head like a battering ram in fierce head-to-head contests with its rivals. *Stegoceras* means 'horny roof'.

STEGOSAURUS **140 MYA**

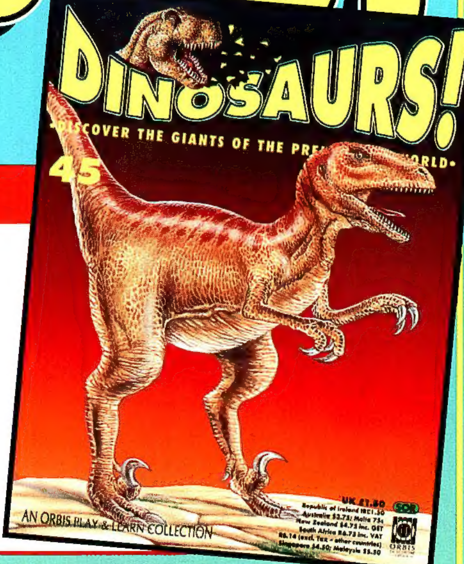
Stegosaurus (steg-oh-saw-rus) was about as long as two cars. It had two rows of diamond-shaped plates along its back and a powerful spiky tail. *Stegosaurus* lived in North America in the Late Jurassic Period and fed on soft, leafy food with its weak jaws. Its name means 'roofed lizard'. It's thought that *Stegosaurus'* bony plates helped to warm up its body in the sun and cool it down in the wind. Compared with its size, *Stegosaurus'* walnut-sized brain was the smallest of any animal that ever lived.

MYA = MILLION YEARS AGO

COMING IN PART 45 OF



DINOSAURS!


DINOSAURS!
DISCOVER THE GIANTS OF THE PRE… WORLD
45
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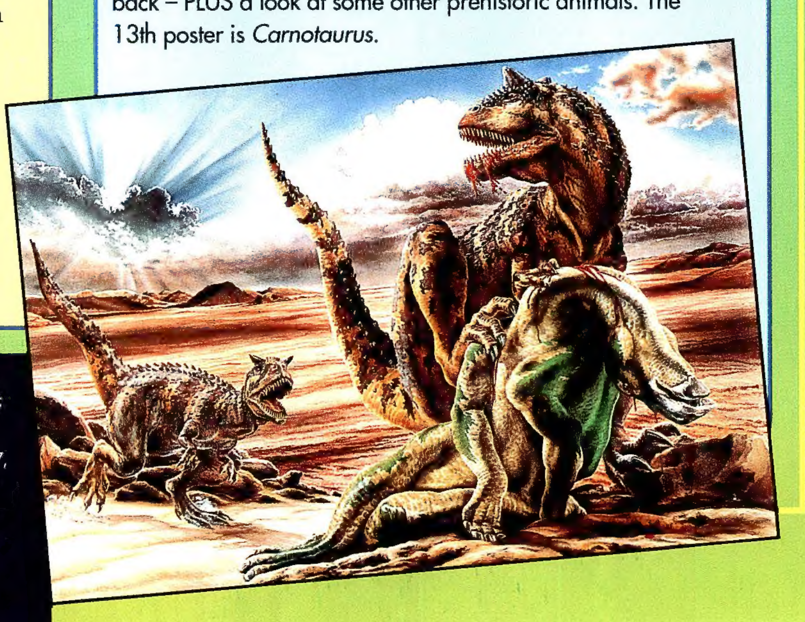
THE DINOSAURS! POSTER COLLECTION

Have you ever wanted to fill your room with dinosaurs? Now you have your chance – with the *Dinosaurs!* POSTER COLLECTION. Each poster is 820 x 570mm (nearly eight times the size of this page) and features a superb dinosaur artwork. You'll find facts and figures about the dinosaur on the back – PLUS a look at some other prehistoric animals. The 13th poster is *Carnotaurus.*



ANSWERS TO DINO FACT FILE QUESTIONS: 1.b 2.a 3.c 4.b 5.c 6.a 7.b 8.c 9.a 10.b

PICTURE CREDITS: Front cover: Steve Roberts/Wildlife Art Agency (WLAA). Ardea: 1038 (tl); Natural History Museum, London: IFC, 1034, 1047; Dr D Norman: 1039 (inset), 1041 (br); George Wimpey plc: 1050 (t); Zefa: 1935 (r), 1051 (t).

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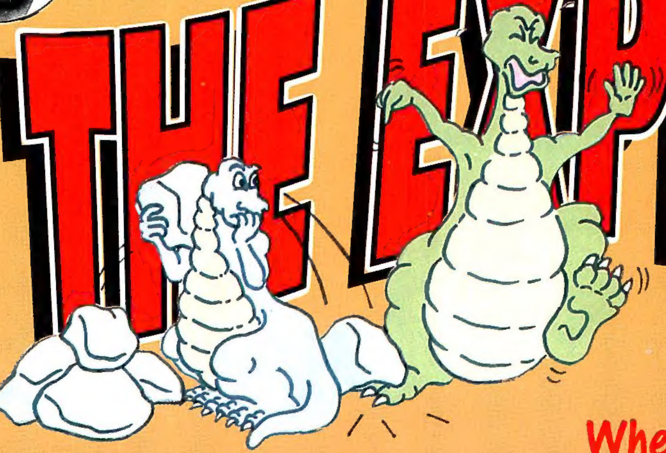
Dr. David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

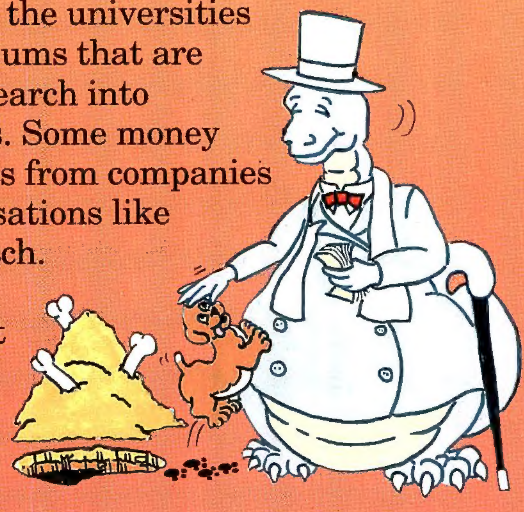


Could dinosaurs pick up rocks?

Any dinosaur with grasping hands – especially some of the smaller ornithopods and many theropods – could probably have picked up rocks. It is also possible that ornithomimosaurs picked up and swallowed stones, storing them in their stomachs. The stones helped these large, bird-like dinosaurs to digest their diet of leaves, twigs, shoots, insects and even lizard bones. Other dinosaurs, such as sauropods, would have plucked hard stones from the ground using their teeth and swallowed them for the same reason.

Who provides the money for dinosaur digs?

Although digs are not very expensive, finding the money for them is always a problem! Most of the funding comes from governments, which also look after the universities and museums that are doing research into dinosaurs. Some money also comes from companies or organisations like Earthwatch. This can be a great help!

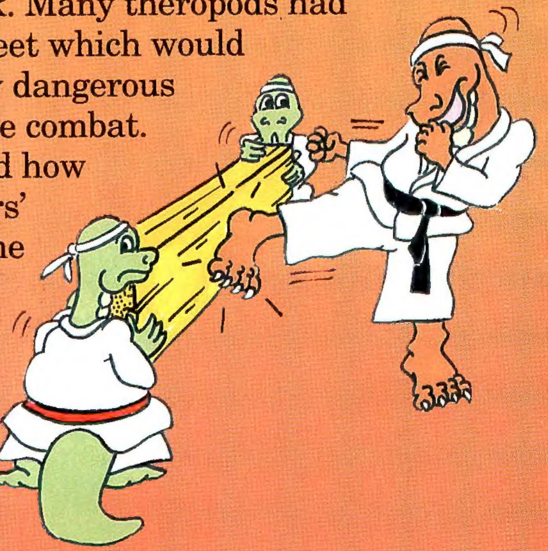


Where have dinosaurs' nests been found?

Dinosaur nests have been found in most parts of the world. They have been dug up in Montana, USA, in Alberta, Canada and in Argentina, South America, as well as in France, South Africa, China and Mongolia. As more dinosaur hunting takes place, more nests will be discovered!

Could dinosaurs kick?

I suspect that all dinosaurs could kick. Some may have kicked in defence – to ward off predators. Others may have kicked in attack. Many theropods had sharp, clawed feet which would have made very dangerous weapons in close combat. Bearing in mind how strong dinosaurs' legs could be, the feet and claws might have caused terrible injuries. The most deadly kickers were dromaeosaurids with their huge, sickle-shaped claws.



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